

REMARKS

Claims 1-36 are pending in this application. No claims have been allowed. The Examiner has rejected claims 1-36 under 35 U.S.C 103(a). Amendments to claims 1, 20, 23, 26, and 33 are submitted in this paper, in the addition to cancellation of claim 5.

Rejections under 35 U.S.C. 103(a)

Claims 1-13, 15-23, 26-33 and 35-36 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,648,721 (Wincheski) in view of Wincheski et al. "Deep Flaw Detection With Giant Magnetoresistive (GMR) Based Self-Nulling Probe," 26th Annual Review of Progress in QNDE, Montreal Canada, July 1999 ('99 Review). Claims 14 and 34 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Wincheski-'99 Review as applied to claims 1 and 33, and further in view of U.S. Patent No. 6,504,363 (Dogaru). Claims 24-25 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Wincheski-'99 Review as applied to claim 1, and further in view of U.S. Patent No. 6,150,809 (Tiernan). The aforementioned rejections are set forth in paragraphs 1-32 of the Office Action. The Examiner stated that affidavits from Mr. Namkung and Mr. Wincheski declaring that there were no materials freely disseminated would provide greater evidentiary weight and, if provided, would be sufficient to overcome the rejection attributed to the '99 Review. Affidavits of Dr. Namkung and Dr. Wincheski are enclosed. Applicants respectfully submit that the Wincheski-'99 Review should be removed as a reference and the rejections based on this publication be withdrawn.

Claims 1-4, 6-12, 15-24, 26-31, 33 and 36 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Wincheski in view of Tiernan. The Examiner argues that Wincheski discloses an excitation coil, a magnetic sensor, a tubular flux focusing lens with one closed end, a flux-focusing shield, and a rotator means, and Tiernan discloses the use of a feedback coil (column 9, lines 57-59) and a tubular cavity that is open at both ends (Fig. 1b). Specifically, the Examiner stated that Teirnan teaches that a feedback filter is used to protect the GMR sensor from large applied fields (column 9, lines 57-59). The Examiner asserts that one of ordinary skill in the art would have been motivated to modify the apparatus of Wincheski with the teachings of Tiernan such that a GMR sensor

was used instead of a coil, with a feedback filter, and further modified such that the tubular flux focusing lens had an opening at two sides.

Applicants respectfully assert that claims 1, 20, 23, and 26, as amended, clearly differentiate the present invention from Tiernan. Tiernan at col. 9, lines 57-59, clearly limits the function of the "active-feedback, loop-filter" to preventing "large applied fields from damaging the GMR sensor." Feedback is used in the present invention to cancel sinusoidal stray fields at the GMR sensor location (see page 8, lines 7-17 and page 13, lines 15-27). A sinusoidal signal from the feedback source is applied to the feedback coil at the excitation coil frequency but 180 degrees out of phase with the GMR sensor output. The resulting output is a D.C. shifted amplitude with only a small A.C. component. Adjusting the feedback in this manner cancels the leakage magnetic fields in the center of the probe. Claims 1, 20, 23 and 26 have been amended to incorporate this operation, along with the cancellation of claim 5 and amendment of claim 33. Accordingly, Applicants assert that claims 1, 20, 23 and 26 are now allowable. Further, in view of their allowability, Applicants assert that claims 2-4, 6-8, 10-19, 21-22, 24-25 and 27-36 that depend therefrom, are also allowable.

CONCLUSION

In view of the above Amendments and Remarks, and the enclosed affidavits, the Applicants submit that all pending claims in the instant application are in condition for allowance. The Applicants respectfully request an early action to this end.

Respectfully submitted,

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APPENDIX